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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/532,283	03/23/2000	Koji Suzuki		1210

23413 7590 06/17/2003

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EXAMINER

ANDUJAR, LEONARDO

ART UNIT

PAPER NUMBER

2826

DATE MAILED: 06/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/532,283

Applicant(s)

SUZUKI ET AL.

Examiner

Leonardo Andújar

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 April 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 and 23-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 and 23-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 13.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Acknowledgment is made of applicants' claim for foreign priority under 35 U.S.C. 119(a)-(d). Acknowledgment is made of applicants' claim for foreign priority based on an application filed in Japan on 03/23/1999. The certified copy of the priority document has been received.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicants are advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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4. Claims 1-19 and 23-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicants' admitted prior art (AAPA) in view of Yamauchi et al. (US 5,640,067).

5. Regarding claims 1 and 13, applicants' admitted prior art (e.g. fig. 1 and 2a -2b) shows an organic electroluminescence device including:

- An organic electroluminescence element 60 and a thin film transistor 30 formed on a substrate 10;
- An organic emissive layer 62 disposed between a first electrode (anode) 61 and a second electrode (cathode) 63;
- A thin transistor active layer 43 made of polycrystalline silicon;
- A planarization insulating film layer 17;
- And a contact hole formed through the planarization insulating film.

6. The anode, which is formed on the planarization insulating film, partially extends to the contact hole. Also, applicants' admitted prior art teaches that the anode is made of indium tin oxide (ITO), which is a transparent conductive material. Moreover, figure 2B shows that the contact hole corresponds to the anode-transistor connecting region. Note that part of the anode-transistor connecting region is laterally covered by the planarization insulating film. Nonetheless, applicants' admitted prior art does not disclose a refractory metal layer connecting a source region or a drain region of the thin film transistor 30 to the anode of the organic electroluminescence element. Therefore, applicants' admitted prior art does not show that the planarization insulating film covers the refractory metal. Moreover, applicants' admitted prior art does not suggest the

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use of a refractory metal or an alloy selected from a metal group consisting of chromium, molybdenum, tungsten and titanium. Yamauchi (e.g. fig. 1) discloses refractory metal layers (111 and 112) connecting a thin film transistor drain region 107 to a transparent electrode 109 of an organic electroluminescence element. As shown in figure 1, the refractory metal layers are laminated in the thickness direction of the light emitting device e.g. substrate. Moreover, Yamauchi teaches that refractory metal layers (e.g. titanium) are used to prevent the silicon atom diffusion from the drain or source region to the drain or source electrode (e.g. aluminum electrode). It would have been obvious to one of ordinary skill in the art at the time the invention was made to form a laminated refractory metal layer (at the anode-transistor contacting region) to connect the drain region to the electroluminescence element anode of applicants' admitted prior art in order to prevent the migration of silicon atoms to the source or drain electrode as taught by Yamauchi (col. 1/lls. 24-30). Since the refractory metal layer is formed in the anode-transistor contacting region, the refractory metal layer had to be covered by the planarization layer.

7. Regarding claims 2 and 14, Yamauchi discloses that the refractory metal is in direct contact with the active layer (fig. 2).

8. Regarding claim 23, Yamauchi shows that the refractory metal layer of the source region is substantially identical in shape to the refractory metal layer of the drain region.

9. Regarding claims 3 and 15, Yamauchi discloses that the first refractory metal layer 111 is in direct contact with an active layer (105, 106 and 107). Also,

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Yamauchi discloses the second refractory metal layer 112 is in direct contact with the transparent electrode 109 (fig. 2).

10. Regarding claims 4 and 16, Yamauchi (fig. 2) shows a conductive metal layer 114 disposed between the first refractory metal 111 and the second refractory metal 112.

11. Regarding claim 24, Yamauchi shows that the conductive metal layer of the source region is substantially identical in shape to the conductive metal layer of the drain region.

12. Regarding claims 5-7 and 17-19, applicants' admitted prior art shows an active layer 43 made of polycrystalline silicon (page 8, lines 8-10). Also, applicants' admitted prior art teaches that the anode 61 is made of indium tin oxide (page 4, lines 19-20). Yamauchi shows a conductive metal 114 made of aluminum (column 4, line 40). Moreover, Yamauchi teaches that the refractory metal layers are made of titanium (column 4, lines 26-67).

13. Regarding claims 8 and 9 applicants' prior art in view of Yamauchi discloses most aspect of the instant invention (see paragraphs 7-8), including a power source line 53 made of aluminum. What applicants' admitted prior art in view of Yamauchi does not disclose is a power source line having a refractory metal in direct contact with the active layer. However, Yamauchi discloses a source electrode (110 and 113) having a laminated refractory metal layer 110 (e.g. titanium) in direct contact with the active layer 105. The refractory metal layer is laminated in a thickness direction of the organic electro luminescence device. Additionally, Yamauchi discloses that conventionally refractory metals,

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such as chromium and titanium, are used to prevent the migration of silicon atoms to the source or drain electrode (col. 1/lls. 34-30). It would have been obvious to one of ordinary skill in the art at the time the invention was made to form the power source of applicants' prior art in view of Yamauchi having a laminated refractory metal layer (e.g. titanium) in direct contact to the active layer in order to prevent the migration of silicon atoms to the electrode as taught by Yamauchi.

14. Regarding claim 25, Yamauchi shows that the refractory metal layer of the source region is substantially identical in shape to the refractory metal layer of the drain region.

15. Regarding claim 10, Yamauchi discloses a first refractory metal layer 111, which is in direct contact with an active layer. Also, Yamauchi discloses a second refractory metal layer 112, which is in direct contact with the transparent electrode of the organic electroluminescence element (fig. 2). Additionally, a conductive metals layer 114 is disposed between the first refractory metal 111 and the second refractory metal 112.

16. Regarding claim 26, Yamauchi shows that the conductive metal layer of the source region is substantially identical in shape to the conductive metal layer of the drain region.

17. Regarding claim 11, applicants' admitted prior art shows an active layer 43 made of polycrystalline silicon (page 8, lines 8-10) and the anode 61 made of indium tin oxide (page 4, lines 19-20).

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18. Regarding claim 12, applicants' admitted prior art shows (fig. 1, 2A and 2B) a pixel has a switching thin film transistor 30 having a gate connected to gate line, one of the source and drain in the active layer made of semiconductor material and connected to a data line. The other source or and drain is connected to a gate of a thin film transistor 40 to control the flow of current supplied from the power source line 53 to the organic electroluminescence element. Moreover, the active layer of the switching thin film transistor making contact with the data line via a metal. Yamauchi discloses a refractory metal to make contact with a data line.

Response to Arguments

19. In response to applicants' arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

20. In response to applicants' argument that AAPA in view of Yamauchi does not teach or suggest all of the limitations of claims 1, 8, 13 because Yamauchi structure is not laminated in the thickness direction of the insulative substrate, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642

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F.2d 413, 208 USPQ 871 (CCPA 1981). In that regards, Yamauchi (e.g. fig. 1) shows that the refractory metal layers (111 and 112) are formed at ends of the source or drain electrode (114) to connect the transparent electrode and source or drain regions. Therefore, Yamauchi teaching suggests that the refractive layers have to be formed at the analogous contact locations of applicants' admitted prior art electrode in order to prevent the electrode of being contaminated with silicon. The analogous contact locations are the top and bottom regions of applicants' admitted prior art source or drain electrode. The adverse effects of the silicon diffusion are well known in the art. In conclusion, Yamauchi teaching is used to demonstrate that one having ordinary skill in the art at the time of the invention was made would use refractory metal layers at the electrode contact regions in order to prevent the silicon diffusion

21. Applicants argue that the Examiner is using Applicants' own invention as a reference against Applicants. Examiner respectfully disagrees because AAPA and Yamauchi not only teach all of the claimed limitations but also provide incentives and suggestions to combine their teachings. As stated in the previous office action Applicants' admitted prior art clearly shows "a planarization insulating film 17, an anode 61 formed on the planarization insulating film, a contact hole formed through the planarization film. Also, the anode partially extends the contact hole". As shown in figure 2B that the contact hole corresponds to an anode-transistor connecting region. Note that part of the anode-transistor connecting region is laterally covered by the planarization insulating film. Yamauchi (e.g. fig. 1) discloses refractory metal layers (111 and

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112) connecting a thin film transistor drain region 107 to a transparent electrode 109 of an organic electroluminescence element. Also, Yamauchi teaches that it is advantageous to connect the anode and the transistor via a refractory metal layer (see comment above). Since the refractory metal layer is formed in the anode-transistor contacting region of applicants' admitted prior art in view of Yamauchi's device, the refractory metal layer had to be covered by the planarization layer. In this case, the refractory metal layer will be laterally covered.

22. In response to applicants' argument that the prior art made of record does not suggest that the use of a refractory layer as claimed by Applicants allows the anode surface to be planarized and thus, unevenness in brightness can be prevented, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

Conclusion

23. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a). A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the

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advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

24. Papers related to this application may be submitted directly to Art Unit 2826 by facsimile transmission. Papers should be faxed to Art Unit 2826 via the Art Unit 2826 Fax Center located in Crystal Plaza 4, room 4C23. The faxing of such papers must conform to the notice published in the Official Gazette, 1096 OG 30 (15 November 1989). The Art Unit 2826 Fax Center number is **(703) 308-7722** or **-7724**. The Art Unit 2826 Fax Center is to be used only for papers related to Art Unit 2814 applications.

25. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Leonardo Andújar** at **(703) 308-0080** and between the hours of 9:00 AM to 5:00 PM (Eastern Standard Time) Monday through Friday or by e-mail via Leonardo.Andujar@uspto.gov. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn, can be reached on (703) 308-6601. Any inquiry of a general nature or relating to the status of this application should be directed to the **Group 2800 Receptionist** at **(703) 305-3900**.

26. The following list is the Examiner's field of search for the present Office Action:

Field of Search	Date
U.S. Class / Subclass (es): 257/40, 501; 438/7	06/03
Other Documentation:	
Electronic Database(s): East	06/03

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(USPAT, US PGPUB, JPO, EPO, Derwent, IBM TDB)	
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Leonardo Andújar

Patent Examiner Art Unit 2826

LA

6/13/03



Minhloan Tran
Primary Examiner
Art Unit 2826